"Chris R. Varga"
<Varga.Chris@azdeq.gov>
06/06/2007 02:18 PM

To Karen Irwin/R9/USEPA/US@EPA
cc Peter Kozelka/R9/USEPA/US@EPA, "Mahota J. Hadley" <Hadley.Mahota@azdeq.gov>, "Jason W. Sutter" <Sutter.Jason@azdeq.gov>
bcc
Subject RE: Fw: grant files -- pls modify to be consistent with extension into FY08

Thanks Karen. Attached is our Lake Mary submittal with update in bold text.
Hopefully, it will suffice as well.

Chris

-----Original Message-----
From: Irwin.Karen@epa.gov [mailto:Irwin.Karen@epa.gov]
Sent: Tuesday, June 05, 2007 10:31 AM
To: Chris R. Varga
Cc: Kozelka.Peter@epamail.epa.gov
Subject: Re: Fw: grant files -- pls modify to be consistent with extension into FY08

Chris, thanks for making the revisions -- they look fine for our needs.

Karen

Peter Kozelka/R9/USEPA/US
06/04/2007 04:32 PM

To Karen Irwin/R9/USEPA/US@EPA
cc
Subject Fw: grant files -- pls modify to be consistent with extension into FY08

----- Forwarded by Peter Kozelka/R9/USEPA/US on 06/04/2007 04:32 PM -----

"Chris R. Varga" <Varga.Chris@azdeq.gov>
06/04/2007 03:54 PM

To Peter Kozelka/R9/USEPA/US@EPA
cc "Mahota J. Hadley"

<Hadley.Mahota@azdeq.gov>

Subject
RE: grant files -- pls modify to be consistent with extension into FY08

Peter,
The Queen Creek revision is attached in support of the grant extension request. Changes to the original language are in bold. We will be getting to Lake Mary this week. Is this what you had in mind?

Chris Varga, Manager
Surface Water Section
ADEQ

 Lake Mary 104b3 Amend#2.doc

Lake Mary Region Mercury TMDLs
Amendment #2 (06/0707)

Name of Project: Lake Mary Region Mercury TMDLs

Contact Information:

Joan Card, Director
Water Quality Division
Arizona Department of Environmental Quality
1110 West Washington Street
Phoenix, Arizona 85007
(602) 771-2306; (602) 771-4634 (FAX)
card.joan@azdeq.gov

Is This a Continuation of a Previously Funded Project/Experience with 104(b)(3) Grants: Yes. **This amendment is a continuation of a previously funded project-EPA grant #CP-97995301-0 which was awarded in July, 2004. Amendment #1, dated 6/30/05 added $10,000 for air monitoring. ADEQ is requesting an extension of this grant through June 30, 2008 with no additional funds. The projected balance as of June 30, 2007 equals $5,846.**

Proposed Budget (includes funds covered under Amenedment #1):

	Total Project Cost	Proposed ADEQ Cost Share	EPA Funding
Personnel	$ 8,730	$ 8,730	$ 0
ERE	2,271	2,271	0
Professional and Outside:			
ISA Northern Arizona University	25,000	0	25,000
Professional (Modeling)	95,000	0	95,000
Analytical (TMDL Lake samples)	29,000	10,000	19,000
(Background Lake samples)	11,000	0	11,000
(Fish Tissue samples)	3,582	3,582	0
(Air monitoring)	10,000	0	10,000
Indirect	5,417	5,417	0
Total	$190,000	$ 30,000	$160,000

Proposed Federal Funding

Dollar amount requested from EPA in 2004:	$ 150,000
Amendment Dollar amount requested from EPA in 2005:	$ 10,000

Proposed Recipient Cost Share

Dollar amount of voluntary leverage funding offered by the State:	$ 30,000

Proposed Amount of Total Project Budget $ 190,000

Cost Effectiveness

Simultaneous development of four mercury TMDLs in the Lake Mary Region will reduce personnel time and eliminate the need for individual modeling contracts. As ADEQ has a number of other mercury impaired lakes that will require TMDLs, the technical approach and information from this project may be transferable to these other TMDLs.

Project Description

Completion of this project will result in the development of four Total Maximum Daily Loads (TMDLs) in the Lake Mary region near Flagstaff, Arizona for mercury-impaired lakes: Upper and Lower Lake Mary, Soldier Lake, and Long Lake. Completion of these TMDLs is a high priority because of the toxic threat to humans and animals from high levels of mercury in fish. These lakes are in close proximity of Flagstaff and receive significant sport fishing pressure throughout most of the year. Additionally, Upper and Lower Lake Mary carry a Domestic Water Source (DWS) designation and serve as a secondary water supply for the City of Flagstaff. Upper and Lower Lake Mary were listed by EPA Region 9 as impaired under section 303(d) of the Clean Water Act following advisories instituted by Arizona Department of Environmental Quality (ADEQ) and the Arizona Game and Fish Department (AGFD). Elevated concentrations of mercury in fish tissue collected from Soldier Lake and Long Lake have resulted in fish consumption advisories being issued and will likely be listed by EPA on the 2004 303(d) list.

ADEQ's Watershed Management Unit (WSMU) will communicate project progress, develop the TMDL implementation plans and distribute results to the stakeholders. ADEQ's Air Quality Division will offer guidance on site selection and assist with data collection, analysis and modeling of any air deposition data. The Air Division will also provide support during contract review and model development, as applicable. As part of this project, ADEQ will partner with Northern Arizona University (NAU) to sample lake sediment cores to try and characterize the recent history of metals deposition in these lakes. These intra- and inter-agency partnerships have been formed to develop the data sets necessary to discern non-point and point source contributions; quantify loads and allocations so that TMDLs can be calculated; and to establish effective implementation strategies.

Regional Setting

All of these lakes are located in the Coconino National Forest and are within the Little Colorado River Watershed. Upper and Lower Lake Mary are hydrologically connected and are located 6 miles south east of Flagstaff. Soldiers and Long Lake are two of three hydrologically connected lakes located 35 miles south east of Flagstaff. The geology of the surrounding area for these lakes and their immediate watersheds are underlain by a complex series of volcanic and sedimentary rocks.

Task #1- Collect Fish Tissue

In support of these TMDLs and to gauge the extent of the problem, ADEQ and AZGF are currently developing a sample plan for the collection and analysis of fish tissue from other waterbodies in this region. Samples will be taken this spring from a minimum of three additional lakes to determine if impairment is localized. The mean mercury concentration for walleye taken from the Soldiers Lake/Long Lake complex was 1.65 mg/kg [range from 1.1 mg/kg to 2.7 mg/kg]. This triggered the issuance of fish advisories for both lakes. A tissue sample collected from Soldiers Lake (2.7 mg/Kg) is the highest concentration ever recorded by ADEQ's Priority Pollutant Program. In contrast, fish tissue from lakes selected to measure the natural background concentrations of mercury in the region (Willow Springs Lake, Ashurst Lake and Stoneman Lake) show no impairment.

Task #2- Conduct Watershed/Lake/Aerial Reconnaissance & Sampling

2a) Identify potential sources

The sources of mercury to these lakes are unknown at this time. There is no evidence of past or present mining in any of the lake watersheds. Potential sources include: 1) geology (e.g., cinnabar is often associated with volcanic rock formations), 2) atmospheric deposition (e.g., little actual Arizona deposition data is currently available) and 3) historic land use practices (e.g., sawmill and railroad). ADEQ will conduct watershed and lake reconnaissance to identify potential sources and mechanisms for loading.

2b) Complete Sample & Analysis Plan
ADEQ will review and assess the results from field reconnaissance, fish tissue results, and historic water quality data to develop the TMDL Sample & Analysis Plan (SAP). The SAP will provide for the extent and locations for the collection of credible data sufficient to identify sources, calculate loads and allocations, and calculate the TMDLs.

2c) Complete surface water and sediment sampling
Additional monitoring data is needed in order to develop a model and TMDL loads. ADEQ has performed two sampling events on Upper and Lower Lake Mary using ultra clean sample and analysis techniques. Screen sampling has been conducted at Kinnikinick Lake, Morman Lake, Soldiers Lake, Long Lake and Ashurst Lake. Mercury has been detected in the water column and sediments in all of these lakes. Over the first year of the project, ADEQ will conduct additional sampling on the four lakes with fish advisories and three background lakes. Sampling at two additional lakes may occur if the reconnaissance reveals further listings for mercury contamination.

2d) Perform wet deposition air monitoring to aid in source identification

ADEQ has obtained the equipment necessary to establish the first Mercury Deposition Network (MDN) site in Arizona. MDN is a cooperative effort with National Atmospheric Deposition Network program office. The Water Quality Division is working with the Air Quality Division (AQD) and the MDN-NADN Program to install the equipment at the ADEQ's Sycamore Canyon Improved Air Monitoring Station outside Williams, AZ. NADP staff will be traveling to Arizona in July, 2005 to train ADEQ staff in proper equipment operation and MDN sampling protocols.

Rain water samples collected by the equipment are analyzed for total mercury via EPA Method 1631E along with the corresponding quality control samples and protocols. The MDN Quality Assurance (QA) Plan has been approved by NADP Technical committee in 1997. see http://nadp.sws.uiuc.edu/lib/qaplans/mdn-qap-1997.pdf
MDN participants follow guidelines in MDN QA plan and procedures established for interregional research projects by cooperative State Research Service (USDA, 1987). All analytical work or the MDN Program is done by Frontier Geosciences in Seattle, WA. This amendment is to add $10,000 in EPA discretionary funding in support of the analytical work for the wet deposition sampling.

Task #3- Characterize Metals Deposition
The Civil & Environmental Engineering Department (CEE) at NAU has proposed using 1.0 meter long surface sediment cores from both non-impacted and impacted lakes to characterize the recent (~50yrs) history of metals deposition in the region. Discrete sections of the cores will be analyzed for total mercury and three different isotopes of lead to determine if mercury and lead have been present in the sediments of these lakes, and if so, at what levels. If metals contamination has occurred, NAU will compare the timing among all the lakes. Concurrent arrival would indicate a widespread source consistent with atmospheric deposition. NAU will

also examine ratios of lead isotopes as geologic and atmospheric sources may have distinctly different lead-isotope ratios and may provide information regarding sources.

Separate from this grant , the principle investigator on the coring study has also applied for an Intramural Grant within NAU to conduct a study of how fish in contaminated lakes bioaccumulate mercury using nitrogen stable isotopes. The study area would include Upper Lake Mary and Ashurst Lake. Both waterbodies contain elevated levels of mercury in the sediment, but fish from Ashurst Lake do not show contamination.

Task #4- Develop Model for Load Allocations and TMDL
It is anticipated that a dynamic water quality model(s) capable of modeling watershed and in-lake processes will be necessary to discern mercury concentrations originating from air, native soil, and anthropogenic sources; allocate loads needed for TMDL calculations; and identify and/or confirm the mechanisms for loading. Aerial deposition will present an additional challenge and will likely require a separate airshed model. This will require assistance and guidance from ADEQ's Air Division. ADEQ proposes modeling for the four listed lakes and will produce four mercury TMDLs, one for each lake.

Task # 5- Communicate Results
ADEQ will activate the stakeholder process early in this project with much of the public outreach/participation process being handled by the Watershed Management Unit. The principal stakeholders include: Arizona Game and Fish Department; US Forest Service (Coconino National Forest); City of Flagstaff; US Fish & Wildlife Service, US Geological Survey; private land owners and interested parties.

ADEQ anticipates holding a kickoff meeting in early summer to introduce the ADEQ team, present the issues, discuss work to date and the project. The next meeting will be after a contractor has been selected and has reviewed the available data. At this meeting, ADEQ will discuss possible modeling approaches, the extent of the dataset and pros and cons to the models. Future meeting(s) will present model runs with different scenarios leading up to a final model output and presentation of draft TMDL allocations and needed reductions. Review of the TMDL report and the TMDL implementation plan require additional meetings, public notices in local newspapers and the *Arizona Administrative Register*. Status of the process and key deliverables will also be posted on ADEQ's website for review.

As companions to the TMDL reports, WSMU will work with the stakeholders to develop a TMDL implementation plan that will clearly identify and prioritize water quality improvement actions (i.e. BMPs) necessary to address identified sources and achieve reductions, determine the anticipated timeframe to attain surface water quality standards, and identify possible funding sources.

Task # 6- Submit TMDLs
Four final TMDLs will be submitted to EPA following an extensive public comment period. Each will contain numeric and narrative targets for mercury based on the results of the tasks above. Deliverables to the EPA will include draft TMDL reports in January, 2006 and final TMDL reports by June 2006. ADEQ will provide project updates to the EPA during the regularly planned monthly teleconference and quarterly exception reporting.

Performance Measures
The table below identifies key deliverables to track progress towards completion of the project within the grant window. Indicators and benchmarks determined through modeling and

development of the actual TMDLs and the associated allocations and reductions will be tracked through the effectiveness monitoring that will be established for these lakes after commencement of implementation strategies.

Expected Project Results and Accomplishments Including Performance Measures and Results

Tasks	Deliverables	Target Date
#1- Collect Fish Tissue	Data to determine extent of impairment	April 2004
#2- Conduct Watershed/Lake Reconnaissance		
#2a- Identify Potential Sources	Source Identification	May 2004
#2b- Complete Sample & Analysis Plan	Approved sample & analysis plan	June 2004
#2c- Complete surface water and sediment sampling	Data for TMDLs model development	July 2005
#2d Perform wet deposition air monitoring to aid in source identification	Data for TMDL model development	July, 2005
#3- Characterize Metals Deposition (NAU)	Report submitted to ADEQ	July – September 2004
#4- Develop Model for TMDLs, load allocations and reductions	TMDLs, load allocations & reductions	August – November 2005
#5- Communicate Results	Stakeholder involvement	Commence Summer 2004
#6- Submit TMDLs Draft TMDL Reports Final TMDL Reports	**Five (5)** TMDLs	**August, 2007** **January, 2008**

Rationale for extension

ADEQ is requesting that the Lake Mary Region TMDL be extended until June 30, 2008 to allow completion of the study. ADEQ has completed tasks 1-4 and partially completed tasks 5 and 6. ADEQ has engaged stakeholders throughout the Lake Mary Region TMDL study. Once the draft TMDL report has been finalized and reviewed internally a 30-day public comment period will commence. A public meeting will be held near the beginning of the comment period. The remaining funds in the grant will be used by the contractor to provide technical assistance at the public meeting, model familiarization training for ADEQ staff, and responses to public comments. Based on stakeholder concerns ADEQ will not submit mercury TMDLs to EPA Region IX for final approval until adoption of our Fish Tissue Implementation Procedures which are included in our Triennial Review of Water Quality Standards. It is anticipated the TR process will be completed in early 2008.

104(b)(3) Lake Mary Region Mercury TMDLs

Budget Period 07/01/04 Thru 06/30/06

Amendment #1 06/30/05

SECTION	CONTRACTS		COST
Hydrologic S&A	ISA Northern Arizona University (sole source)		$25,000
	Professional modeling (competitive)		$95,000
	Analytical:		
	TMDL Lake Samples	($19,000)	
	Background Lake Samples	($11,000)	
	Subtotal Water Analyses		$30,000
	Wet deposition air monitoring/source identification		$10,000
			$160,000